

**AMENDMENTS TO THE CLAIMS**

1-69. (Canceled)

70. (Currently amended) A probe for use with an introducer in a patient having a vessel carrying blood to ascertain characteristics of the blood comprising a cannula having proximal and distal extremities, the distal extremity of the cannula being adapted to be inserted into the vessel of the patient, an oxygen and carbon dioxide sensor assembly disposed in the distal extremity of the cannula for providing an electrical signal when the cannula is disposed in the blood, the cannula being made of a gas-permeable material in the vicinity of the oxygen and carbon dioxide sensor assembly, and a connector carried by the proximal extremity of the cannula whereby the distal extremity of the cannula is adapted for slidable travel through the introducer when inserting the cannula into the vessel, the cannula and connector having a size which permits the introducer to be slid off of the proximal extremity of the cannula and the connector after the distal extremity of the cannula has been inserted into the vessel and whereby the oxygen and carbon dioxide sensor assembly is mounted in the distal extremity of the cannula and comprises an electrically insulating conduit having a distal portion, a first working electrode, a second working electrode, a first reference electrode and a second reference electrode, ~~the second reference electrode extending at least partially around the electrically insulating conduit,~~ first, second, third, and fourth conductors extending from the proximal extremity of the cannula to the oxygen and carbon dioxide sensor assembly, wherein the first conductor is electrically coupled to the first working electrode and the second conductor extends through the electrically insulating conduit and is coupled to the second working electrode, the third conductor is electrically coupled to the first reference electrode, and the fourth conductor is electrically coupled to the second reference electrode, the electrically insulating conduit serving as a support for the first reference electrode and as a conduit for the fourth conductor.

71. (Previously Presented) The probe of Claim 70 further comprising a flex circuit extending through at least a portion of the cannula, the flex circuit having proximal and distal portions with first and second electrodes formed on the distal portion and first and second conductors extending from the proximal portion to the first and second electrodes, the first and second electrodes and the first and second conductors forming at least part of the oxygen and carbon dioxide sensor assembly.

72. (Previously Presented) The probe of Claim 71 wherein at least part of the proximal portion of the flex circuit serves as the connector

73. (Previously Presented) The probe of Claim 71 wherein the flex circuit has an exposed surface, the first and second electrodes each being a pad formed on the exposed surface.

74-75. (Canceled)

76. (Currently Amended) ~~The probe of Claim 25~~ A small-diameter probe for use with an introducer in a patient having a vessel carrying blood to ascertain characteristics of the blood comprising a cannula having proximal and distal extremities, the distal extremity of the cannula being adapted to be inserted into the vessel of the patient, an oxygen and carbon dioxide sensor assembly disposed in the distal extremity of the cannula for providing an electrical signal when the cannula is disposed in the blood and a connector carried by the proximal extremity of the cannula whereby the distal extremity of the cannula is adapted for slidable travel through the introducer when inserting the cannula into the vessel, the cannula and connector having a size which permits the introducer to be slid off of the proximal extremity of the cannula and the connector after the distal extremity of the cannula has been inserted into the vessel and wherein the sensor assembly comprises at least one insulating layer surrounding a proximal working electrode of a proximal sensor and at least one insulating layer surrounding a distal working electrode of a distal sensor, the proximal sensor comprising a proximal reference electrode and the distal sensor comprises a distal reference electrode, wherein both of said reference electrodes extend at least partially around the at least one insulating layer and wherein the distal working electrode, or a conductor in electrical contact with and extending from the distal working electrode, extends through the at least one insulating layer surrounding the proximal working electrode, where at least one of the working electrodes extends at least partially around at least one insulating layer.

77. (Previously Presented) The probe of Claim 70 where the insulating conduit is a tube.

78. (Currently Amended) The probe of Claim 70 where the first working electrode extends at least partially around the ~~tube~~ insulating conduit.

79. (Currently Amended) The probe of Claim 78 where the first reference electrode extends at least partially around the ~~tube~~ insulating conduit.

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80. (New) The probe of Claim 70 where the second reference electrode extends at least partially around the electrically insulating conduit.